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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	BAXTER, R.
Appl. No.	:	10/765,959
Filed	:	January 29, 2004
Title	:	HYDRAULIC CLUTCH ACTUATOR FOR LIMITED SLIP DIFFERENTIAL ASSEMBLY
Group Art Unit	:	3681
Examiner	:	RODRIGUEZ, S.
Docket No.	:	08200.709

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

January 31, 2006

Hon. Comissioner of Patents
and Trademarks
Washington, D.C. 20231

Dear Sir:

In follow-up to the Notice of Appeal filed December 6, 2005, Appellant respectfully requests the Board of Patent Appeals and Interferences consider the following arguments and reverse the decision of the Examiner in whole.

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(1) Real Party in Interest

The real party in interest is TORQUE-TRACTION TECHNOLOGIES, INC.

(2) Related Appeals and Interferences

There are no known related appeals or interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal.

(3) STATUS OF CLAIMS

1. Claims 1, 4-11, 13-20 and 23 are pending in the application.

2. Claims 2, 3, 12, 21 and 22 have been canceled.

3. Claims 1, 4-11, 13-20 and 23 have been rejected and are being appealed.

(4) STATUS OF AMENDMENT

The Office Action finally rejecting claims 1, 4-11, 13-20 and 23 was mailed on September 9, 2005. On October 31, 2005 Appellant filed Request for Reconsideration presenting arguments for the patentability of claims 1, 4-11, 13-20 and 23. On November 21, 2005 the Examiner issued an Advisory Action Before the Filing of an Appeal Brief indicating that the Request for Reconsideration of October 5, 2005 has been considered by the Examiner

but does not place the application in condition for allowance. Subsequently, there have been no other papers filed by the Appellant or issued by the U.S. PTO.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The instant invention, as claimed in independent claim 1, is directed to a torque transmitting apparatus (10) (Figs. 1 and 2) comprising a differential assembly (20) (see page 6, lines 9-10), a housing (12) rotatably supporting the differential assembly (20) (see page 6, lines 15-17), and a drive pinion (26) provided for rotating the differential assembly (20) (see page 6, lines 21-22). The differential assembly (20) includes a differential case (22) (see page 6, lines 19-20) and at least one output shaft (24a, 24b) (see page 7, lines 1-3). The torque transmitting apparatus (10) further comprises at least one friction clutch assembly (30) for selectively engaging and disengaging the differential case (22), and the at least one output shaft (24a, 24b) (see Figs. 1 and 3; page 7, lines 15-17 and page 8, lines 4-7) and a hydraulic clutch actuator for selectively operating the at least one friction clutch assembly (30) between a disengaged condition and an engaged condition (see page 8, lines 8-10). The hydraulic clutch actuator includes a hydraulic pump (32) providing a hydraulic fluid under pressure and a hydraulic pressure accumulator (36) selectively communicating with the hydraulic pump (32) for charging the hydraulic pressure accumulator (36) with the hydraulic fluid under pressure (see Fig. 3; page 11, lines 5-11). The hydraulic pump is mounted within the housing (12) about a pinion shaft (26b) of the drive pinion (26) (see Figs. 1 and 2; page 10, lines 16-17). The hydraulic pressure accumulator (36) mounted to the housing (12) (see Fig. 2; page 9, lines 14-15) and selectively communicates with the at least one friction clutch assembly (30)

for selectively engaging the at least one clutch assembly (30) (see Fig. 3; page 10, lines 13-15 and page 11, line 19 – page 12, line 2).

The instant invention, as claimed in independent claim 23, is directed to a torque transmitting apparatus (10) (Figs. 1 and 2) comprising a housing (12) rotatably supporting a differential assembly (20) (see page 6, lines 9-10 and 15-17) and a drive pinion (26) provided for rotating the differential assembly (20) (see page 6, lines 21-22). The differential assembly (20) includes a differential case (22) (see page 6, lines 19-20) and at least one output shaft (24a, 24b) (see page 7, lines 1-3). The torque transmitting apparatus (10) further comprises a friction clutch assembly (30) for selectively engaging and disengaging the differential case (22) and the at least one output shaft (24a, 24b) (see Figs. 1 and 3; page 7, lines 15-17 and page 8, lines 4-7), a hydraulic clutch actuator for operating the friction clutch assembly (30) between a disengaged condition and an engaged condition (see page 8, lines 8-10), and a fluid reservoir (33) disposed in the housing (12) for storing a supply of the hydraulic fluid (see page 8, lines 14-17). The hydraulic clutch actuator includes a gerotor pump (32) mounted within the housing (12) about a pinion shaft (26b) of the drive pinion (26) and providing a hydraulic fluid under pressure (see Figs. 1 and 2; page 10, lines 16-17), a hydraulic pressure accumulator (36) mounted directly to the housing (12) (see Fig. 2; page 9, lines 14-15) and selectively communicating with the pump (32) for charging the accumulator (36) with the hydraulic fluid under pressure (page 11, lines 5-11), a directional valve (34) disposed in a wall (15') of the housing (12) (see Fig. 2 and paragraph beginning at page 9, line 6 (see Amendment of June 17, 2005)) and provided for selectively directing the hydraulic fluid from the pump (32) to the hydraulic pressure accumulator (36) and from the gerotor pump (32) to

the fluid reservoir (33) (see Fig. 3; page 8, lines 17-22 and page 11, lines 8-15), a solenoid-operated control valve (40) disposed in the wall (15') of the housing (12) (see Figs. 1 and 2 and paragraph beginning at page 9, line 6 (see Amendment of June 17, 2005)) and providing selective fluid communication between the hydraulic pressure accumulator (36) and the friction clutch assembly (30) for selectively setting the clutch assembly (30) in the engaged condition (see Fig. 3; page 9, lines 2-5, and page 11, line 17 – page 12, line 2), a first communication passage (106) integrally formed in the wall (15') of the housing (12) (see Fig. 2 and paragraph beginning at page 9, line 6 (see Amendment of June 17, 2005)) for fluidly connecting the directional valve (34) with the accumulator (36) (see Figs. 2 and 3; page 8, lines 20-22), a second communication passage (108) integrally formed in the wall (15') of the housing (12) (see Fig. 2 and paragraph beginning at page 9, line 6 (see Amendment of June 17, 2005)) for fluidly connecting the accumulator (36) with the control valve (40) (see Figs. 2 and 3; page 9, lines 2-4), and an electronic control module (44) actuating the control valve (40) in response to an activation of an anti-lock braking system of a vehicle (see Fig. 3; page 9, lines 16-22). The gerotor pump (32) is activated in response to rotation of the drive pinion (26) (see page 10, lines 17-21). Moreover, the fluid reservoir (33) is in fluid communication with the gerotor pump (32) (see page 8, lines 15-16).

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 4-11, 13-20 and 23 stand rejected under 35 U.S.C. 102(b) as being anticipated by Porter (US 6,578,654) (hereinafter referred to as Porter).

(7) ARGUMENTS

Sub-Paragraph (iii)

Claims 1, 4-11, 13-20 and 23 stand rejected under 35 U.S.C. 102(b) as being anticipated by Porter. It is noted that claims 1 and 23 are independent claims. It is also noted that claims 4, 5, 7-9, 13 and 14 depend upon the base claim 1. Claim 6 depends upon claim 5. Claim 10 depends upon claim 9. Claim 11 depends upon claim 10. Claims 15 and 16 depend upon claim 14. Claim 17 depends upon claim 6. Claim 18 depends upon claim 15. Claim 19 depends upon claim 14. Claim 20 depends upon claim 19.

The Examiner alleges that the coupling shown in Fig. 4 of Porter is a differential as it "allows differential rotation" (apparently between the input shaft 42 and the output (pinion) shaft 54). The Examiner further erroneously alleges that the Applicant's assumption of the differential requires only a system of gears, which are not explicitly recited in the claims of the present invention. However, as noted in the definition of the term "differential" defined by the "Dictionary of Automotive Engineering" (Second Edition 1995 by Don Goodsell, CEng, MIMechE, MSAE, Society of Automotive Engineers, Inc., Warrendale, PA), the differential should be capable of dividing the input torque of one shaft between two output shafts where rotation at different speeds is likely to occur, as in cornering." (emphasis added). In other words, the term "differential", as it understood in the mechanical art, necessitates for two output shafts driven by an input shaft and a mechanism of some sort capable of rotating the two output shafts at different speeds.

Furthermore, the Dictionary of Mechanical Engineering (1996 G.H.F. Nayler Fourth Edition) defines the word "differential (or differential gear)" as "an assembly of bevel or spur gear wheels with two coaxial shafts and a third coaxial member with a rotation proportional to the sum or difference of the amounts of rotation of the other two". Moreover, the same Dictionary of Mechanical Engineering (1996 G.H.F. Nayler Fourth Edition) defines the word "differential motion" as "the motion of one part to and from another in a mechanical movement, the speed (velocity) of the driven part being equal to the difference of the speeds of the two parts connected to it". Again, as explicitly defined in the above definitions, the term "differential" necessitates for three shafts.

Contrary to the above definition, the element 44 shown in Fig. 4 of Porter and defined by Porter as "hydraulic coupling" (not differential), has only one output shaft: the pinion shaft 54. In other words, the differential rotation allowed by the hydraulic coupling of Porter is between the input and output shafts, not between the two output shafts, as required by the definition of the term "differential".

Moreover, the drive axle assembly 34 of Porter also includes the differential 46 (shown in Figs. 2 and 7). As shown in the above mentioned Figs. 2 and 7, the device 46, unlike the coupling 44), clearly falls under the definition of differential as it includes two output shafts 58 and 60 driven by an input shaft 54 and a mechanism 56 capable of rotating the two output shafts 58 and 60 at different speeds. Obviously, the hydraulic coupling 44 and the differential 46 of the drive axle assembly 34 could not be both differentials, as it is technically impossibility.

In the Advisory Action Before the Filing of an Appeal Brief dated November 21, 2005, the Examiner accuses Applicant in "limited characterization of a differential", and notes that "a person of ordinary skill in the automotive arts would recognize that a differential may be located between axles (e.g., Subaru Impreza, Mitsubishi Lancer) as disclosed by the prior art of record." Applicant disagrees.

First, Applicant's definition of the term "differential" is supported by the Dictionary of Mechanical Engineering and the Dictionary of Automotive Engineering, which are the most authoritative sources in the automotive and/or mechanical art and could hardly be interpreted as "limited". Applicant believes that the definition of the term "differential" based on the above dictionaries is the most accurate and broad definition, as a person of ordinary skill in the automotive and/or mechanical art would refer to these dictionaries in search of the most proper definition of the term "differential".

Second, Applicant never claimed that the location of the differential is limited to drive axles. Almost every all-wheel-drive (AWD) vehicle includes a differential located between drive axles (such as Subaru Impreza and Mitsubishi Lancer, cited by the Examiner). Such a differential is well known in the automotive art as an "inter-axle" differential. However, as any other differential (e.g., axle differentials), the inter-axle differential necessitates for two output shafts driven by an input shaft and a mechanism of some sort capable of rotating the two output shafts at different speeds.

Therefore, one of ordinary skill in the art would not interpret the hydraulic coupling 44 of the drive axle assembly 34 as the differential. Accordingly, the rejection of claims 1, 4-11, 13-20 and 23 U.S.C. 102(b) as being anticipated by Porter is improper.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance, and notice to that effect is earnestly solicited. Appellant will request an oral hearing on the merits within two months after the date of the Examiner's answer.

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(8) APPENDIX OF CLAIMS ON APPEAL

1. A torque transmitting apparatus comprising:

a differential assembly including a differential case and at least one output shaft;

a housing rotatably supporting said differential assembly;

a drive pinion provided for rotating said differential assembly;

at least one friction clutch assembly for selectively engaging and disengaging said differential case and said at least one output shaft; and

a hydraulic clutch actuator for selectively operating said at least one friction clutch assembly between a disengaged condition and an engaged condition;

said hydraulic clutch actuator including a hydraulic pump providing a hydraulic fluid under pressure and a hydraulic pressure accumulator selectively communicating with said hydraulic pump for charging said hydraulic pressure accumulator with said hydraulic fluid under pressure;

said hydraulic pump is mounted within said housing about a pinion shaft of said drive pinion;

said hydraulic pressure accumulator mounted to said housing and selectively communicating with said at least one friction clutch assembly for selectively engaging said at least one clutch assembly.

4. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic pump is a gerotor pump.

5. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic clutch actuator further includes a directional valve provided for selectively directing the hydraulic fluid from said pump to said hydraulic pressure accumulator.

6. The torque transmitting apparatus as defined in claim 5, wherein said directional valve is disposed in a wall of said housing.

7. The torque transmitting apparatus as defined in claim 1, wherein said at least one friction clutch assembly includes a piston assembly provided for setting said clutch assembly in said engaged condition in response to hydraulic pressure from said accumulator.

8. The torque transmitting apparatus as defined in claim 1, further including a fluid reservoir for storing a supply of said hydraulic fluid, said fluid reservoir is in fluid communication with said hydraulic pump.

9. The torque transmitting apparatus as defined in claim 1, further including a fluid reservoir disposed in said housing for storing a supply of said hydraulic fluid, said fluid reservoir is in fluid communication with said hydraulic pump.

10. The torque transmitting apparatus as defined in claim 9, wherein said hydraulic clutch actuator further includes a directional valve provided for selectively direct the hydraulic fluid from said pump to said hydraulic pressure accumulator and from said hydraulic pump to said fluid reservoir.

11. The torque transmitting apparatus as defined in claim 10, wherein said directional valve directs said fluid from said hydraulic pump to said hydraulic pressure accumulator until a pressure within said accumulator reaches a predetermined value and directs said fluid from said hydraulic pump to said fluid reservoir when the pressure in said hydraulic pressure accumulator reaches said predetermined value.

13. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic pump is activated in response to rotation of said drive pinion.

14. The torque transmitting apparatus as defined in claim 1, wherein said hydraulic clutch actuator further includes a control valve providing selective fluid communication between said hydraulic pressure accumulator and said at least one friction clutch assembly for selectively setting said clutch assembly in said engaged condition.

15. The torque transmitting apparatus as defined in claim 14, wherein said control valve is disposed in a wall of said housing.

16. The torque transmitting apparatus as defined in claim 14, wherein said control valve is a solenoid-operated valve.

17. The torque transmitting apparatus as defined in claim 6, further including a first communication passage integrally formed in a wall of said housing for fluidly connecting said directional valve with said accumulator.

18. The torque transmitting apparatus as defined in claim 15, further including a second communication passage integrally formed in a wall of said housing for fluidly connecting said accumulator with said control valve.

19. The torque transmitting apparatus as defined in claim 14, wherein said control valve is actuated by an electronic control module in response to at least one parameter of a motor vehicle.

20. The torque transmitting apparatus as defined in claim 19, wherein said at least one parameter is an activation of an anti-lock braking system of the vehicle.

23. A torque transmitting apparatus comprising:

a housing rotatably supporting a differential assembly and a drive pinion provided for rotating said differential assembly;

said differential assembly including a differential case and at least one output shaft;

a friction clutch assembly for selectively engaging and disengaging said differential case and said at least one output shaft;

a hydraulic clutch actuator for operating said friction clutch assembly between a disengaged condition and an engaged condition; and

a fluid reservoir disposed in said housing for storing a supply of said hydraulic fluid;

said hydraulic clutch actuator including a gerotor pump mounted within said housing about a pinion shaft of said drive pinion and providing a hydraulic fluid under pressure, a hydraulic pressure accumulator mounted directly to said housing and selectively

communicating with said pump for charging said accumulator with said hydraulic fluid under pressure, a directional valve disposed in a wall of said housing and provided for selectively directing the hydraulic fluid from said pump to said hydraulic pressure accumulator and from said gerotor pump to said fluid reservoir, a solenoid-operated control valve disposed in said wall of said housing and providing selective fluid communication between said hydraulic pressure accumulator and said friction clutch assembly for selectively setting said clutch assembly in said engaged condition, a first communication passage integrally formed in said wall of said housing for fluidly connecting said directional valve with said accumulator, a second communication passage integrally formed in said wall of said housing for fluidly connecting said accumulator with said control valve, and an electronic control module actuating said control valve in response to an activation of an anti-lock braking system of a vehicle;

said gerotor pump being activated in response to rotation of said drive pinion; and

said fluid reservoir being in fluid communication with said gerotor pump.

(9) EVIDENCE APPENDIX

Not applicable

(10) RELATED PROCEEDINGS APPENDIX

Not applicable